

## ABSTRACT OF THE DISCLOSURE

In an adaptive filter for cancelling common-mode noise in digital subscriber  
5 loops, a narrowband noise estimator is used to detect one or more noisy frequency bands  
of the common mode signal and derive therefrom a first noise estimation signal. A  
wideband noise estimator derives from the remainder of the common mode signal a  
second noise estimation signal. The first and second noise estimation signals are  
subtracted from the differential signal. The wideband noise estimator comprises a  
10 bandstop filter for removing the frequencies detected by the narrowband noise estimator,  
an analog-to-digital converter for digitizing the bandstopped signal, and an adaptive filter  
for deriving the second noise estimation signal from the digitized bandstopped signal and,  
in the process, compensating for phase and gain differences, especially attributable to the  
interference being injected at different points along the length of the channel.